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Case Report

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Pulmonary aspergillosis after COVID-19: a case report

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ABSTRACT

COVID-19 is an infectious disease that spreads worldwide, can progress rapidly, affect individuals of all ages, and cause death, especially in the elderly and people with chronic diseases. It has predisposed a relatively high number of patients to acute respiratory distress syndrome, and co-infections are a frequent complication, especially during prolonged hospital stays. Bacterial or viral co-infections with SARS-CoV-2 have been reported in many studies, but knowledge of *Aspergillus* co-infection in patients with COVID-19 is limited. This study presents a 57-year-old male patient with COVID-19 who had had no lung disease before COVID-19 pneumonia. However, after COVID-19 pneumonia with sequels and treatments that include corticosteroids and IL-6 receptor antagonists, an invasive pulmonary *aspergillus* (IPA) cavity occurred immediately. In addition to the fact that COVID-19 infection progresses with destructive parenchymal damage and sequelae, the effectiveness of treatment is limited, and treatment-related side effects and complications can be examined. Therefore, clinical and radiological follow-up of patients whose symptoms persist after infection is essential.

Keywords: Aspergillosis, COVID-19, lobectomy, postcovid pulmonary aspergillosis

INTRODUCTION

Coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which appeared in China in late 2019. Several opportunistic infections as *Aspergillus* spp., *Candida* spp., *Cryptococcus neoformans*, *Pneumocystis jiroveci* (*carinii*), mucormycosis, cytomegalovirus (CMV), Herpes simplex virus (HSV), *Strongyloides stercoralis, Mycobacterium tuberculosis,* and *Toxoplasma gondii* have been identified following severe respiratory viral infections in COVID-19 patients.[1,2] Especially the incidence of fungal infections is high.[3]

CASE

A 57-year-old male patient, who applied to our clinic with complaints of hemoptysis, was hospitalized for further examination and treatment due to a cavitary lesion in the right upper lobe. Nine months ago, he was treated for 55 days as non-intubation in the intensive care unit for five days due to COVID-19 pneumonia Figure 1. During this period, steroid treatment and four flacons of 162 mg tocilizumab (a monoclonal antibody against the interleukin-6 receptor) was given because of respiratory symptoms and sequelae COVID-19 pneumonia Figure 2.

Pulmonary rehabilitation and steroid therapy were continued for three months because dyspnea continuedin the patient whose treatment was terminated Figure 3.

In thorax Computed Tomography (CT), a cavitary lesionwas observed in the right upper lobe who administered withcomplaints of swelling in the legs and hemoptysis in thefourth month of his treatment Figure 4.

After taking a nonspecific culture, the patient continued prophylactic fungal treatment and steroid treatment due to dyspnea. Blood culture, sputum culture, urine culture, fungal culture, and tuberculosis tests, Aspergillom specific IgE, was negative, Total IgE was normal. On the 12th day of his treatment, the patient's general condition was good, and he was discharged after colchicine and steroid treatment were arranged. In the control HRCT after antibiotic treatment, the cavity persisted in the right upper lobe Figure 5.

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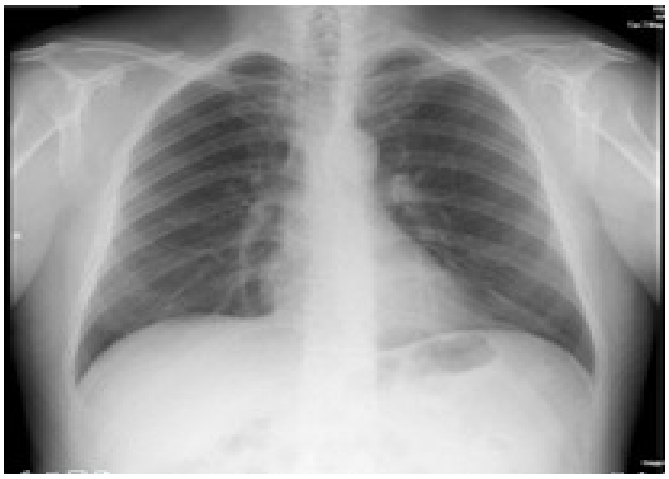

Figure 1. First hospital admission chest X-Ray

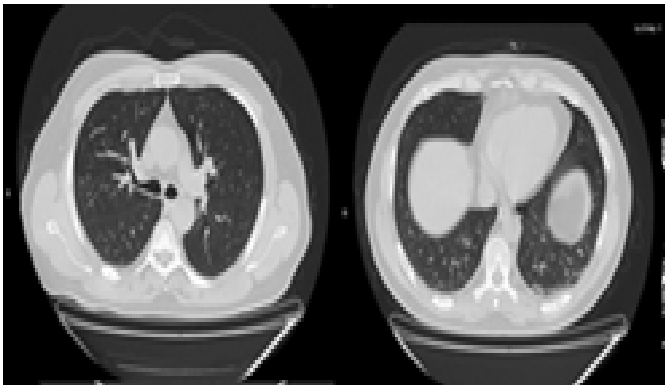

Figure 2. Thorax CT when the patient applied to the hospital for the second time, on 15th day: bilateral ground glass were determined

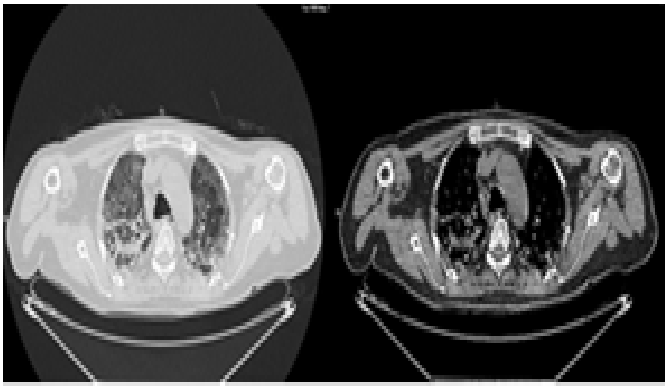

Figure 3. Thorax CT on the 45th day. Ground glass and fibrotic lesions, right upper thin-walled cystic lesion were determined

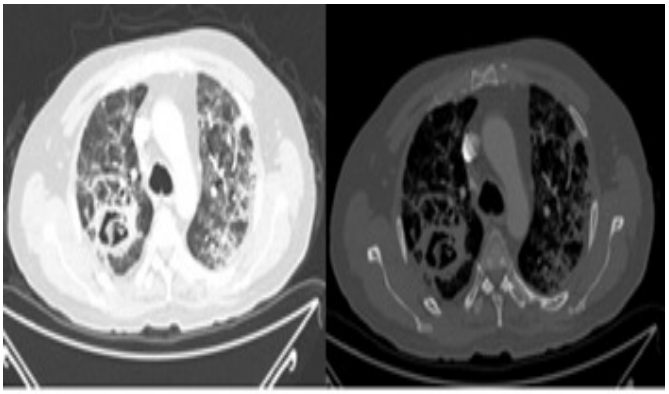

Figure 4. Right upper lobe cavitary lesion was detected in thorax CT angiograph

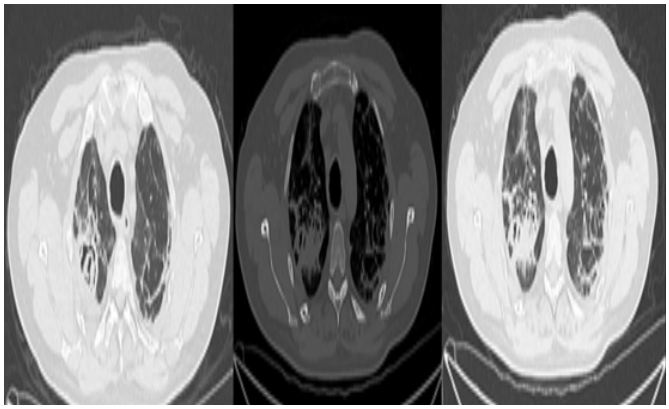

Figure 5. Right upper lobe cavity persisting on control thorax CT, one month after the treatment

Due to intermittent complaints of hemoptysis, right upper lobectomy via thoracotomy was performed. The postoperative pathology result was reported as Aspergilloma (Figure 6) and discharged on the seventh postoperative day without complications. He is in the third month of his follow-up, and any complications occurred.

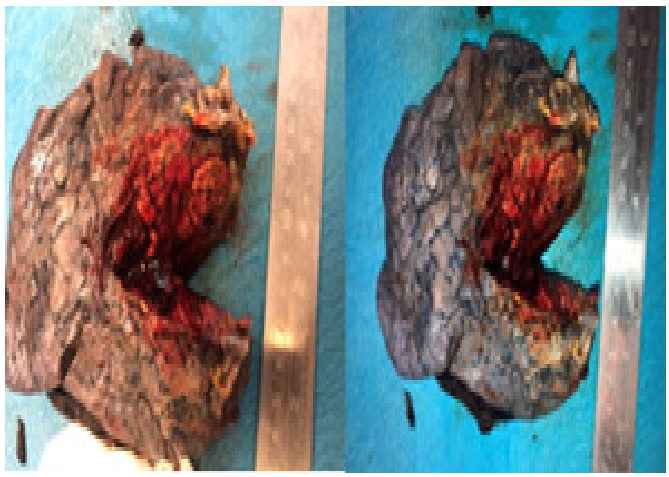

Figure 6. The macroscopic appearance of postoperative specimen of right upper lobectomy with aspergilloma

DISCUSSION

Since the new pneumonia was first recognized in Wuhan, China, at the end of 2019, the causative pathogen SARS-CoV-2 has been identified, and its associated infection, COVID-19, has rapidly evolved worldwide. While SARS-CoV-2 is responsible for severe pneumonia and ARDS, COVID-19 is associated with a wide variety of extrapulmonary complications; many other organs can be affected, including cardiovascular, immune, nervous, and gastrointestinal systems, therefore, can be considered a systemic disease. In addition to common bacteria and viruses, *Aspergillus* can cause co-infection in COVID-19 patients, especially in severe/critical illnesses. The possibility of co-infection with bacterial or fungal infections is higher in patients who require follow-up in intensive care units or require mechanical ventilation.4 Among the possible pathogens in COVID-19 patients, İnvasive pulmonary *aspergillosis* (IPA) carries more attention to *aspergillus* as it is challenging to diagnose and can be associated with high morbidity and mortality. In particular,

respiratory samples for mycological studies such as fungal culture, galactomannan test, and PCR from respiratory tract samples can help early diagnosis. In our case, the culture results of the patient who was followed up and treated with the non-intubated high flow for five days in the intensive care unit during this period were typical.

All studies of COVID-19 fungal infections have reported that they occur during COVID-19 infection, mostly 14 days after the onset of COVID-19 symptoms.[5] In this case, a cavitary lesion in the right upper lobe was observed in the fourth month of the patient's COVID-19 treatment.

In COVID-19-associated pulmonary aspergillosis, diabetes, immunosuppressive drug use, steroid therapy, and intubating are risk factors for patients followed. It also increases the risk of pulmonary aspergillosis in COVID-19 patients using IL-6 antagonists.[6] In our case, four vials of 162 mg tocilizumab were given on the 12th day of the patient's treatment. The patient had fibrotic lesions on the thorax CT, and dyspnea continued. The patient was followed up under steroid and colchicine treatment for about four months after discharge, and a cavitary lesion in the right upper lobe was observed in the fourth-month tomography.

Aspergillosis is one of the most common opportunistic fungal co-infections caused by certain Aspergillus species, mainly affecting immunocompromised individuals such as COVID-19 patients. It can critically affect the respiratory system, leading to a mild/serious lung infection known as pulmonary aspergillosis, a severe form of aspergillosis that worsens over time and has no effective treatment.

CONCLUSION

In patients with severe acute respiratory disease associated with SARS-CoV-2, invasive aspergillosis should be suspected in case of clinical worsening, even in immunocompetent patients. At the same time, aspergillosis should not be forgotten in patients with worsening after steroid and immunomodulator therapy. Pulmonary aspergillosis is a severe complication of COVID-19 patients that may not respond well to medical therapy. Pulmonary resection is the most effective treatment to control the disease.

ETHICAL DECLARATIONS

Informed Consent
The patient signed and free and informed consent form.

Referee Evaluation Process
Externally peer-reviewed.

Conflict of Interest Statement
The authors have no conflicts of interest to declare.

Financial Disclosure
The authors declared that this study has received no financial support.

Author Contributions
All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Talento AF, Hoenigl M. Fungal infections complicating COVID-19: with the rain comes the spores. *J Fungi.* 2020;6(4):279. doi: 10.3390/jof6040279
2. Abdoli A, Falahi S, Kenarkoohi A. COVID-19-associated opportunistic infections: a snapshot on the current reports. *Clin Experim Med.* 2022;22(3):327-346.
3. Mulet Bayona JV, Tormo Palop N, Salvador García C, et al. Impact of the SARS-CoV-2 pandemic in candidaemia, invasive aspergillosis and antifungal consumption in a tertiary hospital. *J Fungi.* 2021;7(6):440.
4. Bassetti M, Giacobbe DR, Grecchi C, Rebuffi C, Zuccaro V, Scudeller L. Performance of existing definitions and tests for the diagnosis of invasive aspergillosis in critically ill, adult patients: a systematic review with qualitative evidence synthesis. *J Infect.* 2020;81(1):131-141.
5. Marr KA, Platt A, Tornheim JA, Zhang SX, Datta K, Cardozo C. Aspergillosis complicating severe coronavirus disease. *Emerg Infect Dis.* 2021;27(1):18.
6. Bartoletti M, Pascale R, Cricca M, et al. Epidemiology of invasive pulmonary aspergillosis among intubated patients with COVID-19: a prospective study. *Clin Infect Dis.* 2021;73(11):e3606-e3614.